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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,770	06/30/2003	Miguel Guerrero	42P16532	2191

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EXAMINER	
CHAN, SAI MING	
ART UNIT	**PAPER NUMBER**
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/611,770	GUERRERO ET AL.	
	Examiner	Art Unit	
	Sai-Ming Chan	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *6/30/3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *6/30/2003 and 11/28/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/24/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on November 24, 2003 has been considered by the Examiner and made of record in the application file.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Liao (U.S. Patent # 7116663)** in view of **Gurenwald (U.S. Patent # 6542896).**

Consider **claim 1**, Liao clearly disclose and show a method comprising:

having multiple-field keys (MFKs) (fig.5 (130, 140, 150 & 160); column 5, lines 61-62) in multiple-field vectors (MFVs) (fig. 5 (ps0 & ps1); column 12, lines 4-18) of entries in a data structure;

generating a set of queries (fig. 5 (ps0, ps1); column 12, lines 4-18) based, at least in part, on the MFKs, wherein each query has a different MFK as a lead MFK ((ps0 has 010001) and (ps1 has 110010)); using a query (column 12, lines 19-46) to determine whether the non-wildcard values in the MFVs of an entry match the non-wildcard values in corresponding MFKs of the search target (fig. 10 (Final Match Vector); column 16, lines1-8); and

using, if no entry has non-wildcard values in the MFVs that match the corresponding non-wildcard values in the MFKs, the queries to determine whether the entry has non-wildcard values in a MFV that match the non-wildcard values in a corresponding lead MFK, plus remaining MFVs that match corresponding remaining MFKs based on matching the non-wildcard values and wildcard values (fig. 10 (EMMM_Lookup) to (Final Match Vector); column 16, lines 9-67, column 17, lines 1-18).

However Liao does not specifically show single fields of a multiple-field source.

In the same field of endeavor, Gruenwald clearly shows the grouping single fields of a multiple-field source (fig. 4 (400); column 6, lines 1-8) into a search target (fig. 7 (740); column 3, lines 24-25).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multi-field search method, as taught by Liao, and provide the group the single fields into search target, as taught by Gruenwald, so that the search can be done proficiently.

Consder **claim 2**, and **as applied to claim 1 above**, Liao, as modified by Gruenwald, clearly shows that the entries of the data structure are stored such that the MFVs that have non-wildcard values are located at the end of the entry (column 1, lines 43-56, (In items 2-4, non-wildcard values are on the left hand side of the Longest Prefix Match route table).

Consder **claim 3**, and **as applied to claim 1 above**, Liao, as modified by Gruenwald, clearly shows that the entries of the data structure are arranged so that the MFVs that have non-wildcard values are placed at the end of the entry (column 1, lines 43-56, (item 5)).

Consider **claim 4**, and **as applied to claim 1 above**, Liao, as modified by Gruenwald, clearly disclose and show the non-wildcard values comprise a fixed value and/or a range of fixed values (column 2, lines 42-44).

Consider **claim 5**, and **as applied to claim 1 above**, Liao, clearly disclose and show the method, further comprising:

locating the entry having non-wildcard values in the MFV that match the non-wildcard values in the corresponding lead MFK, plus remaining MFVs that match corresponding remaining MFKs based on matching the non-wildcard values and wildcard values (fig. 10; column 16, lines 9-67, column 17, lines 1-18); and

performing an operation associated with the located entry (fig. 10 (EMMM_Lookup) to (Final Match Vector)).

Consider **claim 6**, and **as applied to claim 1 above**, Liao, as modified by Gruenwald, clearly disclose the method as described.

However Liao, as modified by Gruenwald, does not specifically show single fields of an item.

In the same field of endeavor, Gruenwald clearly shows the multiple-field source comprises a data packet having single fields in its header (fig. 3; fig. 6; column 8, lines 57-67).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multi-field search method, as taught by Liao, and provide the group the single fields into an item, as taught by Gruenwald, so that the search can be done proficiently.

Consider **claim 7**, and **as applied to claim 6 above**, Liao, as modified by Gruenwald, clearly disclose the operation comprises one of the following: dropping the data packet, mirroring, metering, traffic shaping, rate limiting, accounting, statistics gathering, providing quality of service (QoS), redirecting to a central processing unit

(CPU) for further processing, or sampling a subset of the packets to a CPU (column 1, lines 12-26; fig 12; column 6, lines 12-13; in addition, the application (paragraph 18) indicates that the above mentioned functions are known in the art).

Consider **claim 8**, and **as applied to claim 1 above**, Liao, as modified by Gruenwald, clearly disclose the method, wherein fewer than all MFVs in the entries include one single field (fig.5 (ps0 and ps1); column 12, lines 4-18).

Consider **claim 9**, and **as applied to claim 1 above**, Liao, as modified by Gruenwald, clearly disclose the method, wherein the MFVs in the entries include two or more single fields (fig.5 (ps0 and ps1); column 12, lines 4-18).

Consider **claim 10**, Liao clearly disclose and show an apparatus comprising:

a data structure having a plurality of entries, wherein each entry has a group of multiple-field vectors that each include all wildcard values or all non-wildcard values; and

a search unit having multiple-field keys (MFKs) (fig.5 (130, 140, 150 & 160); column 5, lines 61-62) in multiple-field vectors (MFVs) (fig. 5 (ps0 & ps1); column 12, lines 4-18) of entries in a data structure, generate a set of queries (fig. 5 ((ps0, ps1);

column 12, lines 4-18) based, at least in part, on the MFKs, wherein each query has a different MFK as a lead MFK ((ps0 has 010001) and (ps1 has 110010)), use a query (column 12, lines 19-46) to determine whether the non-wildcard values in the MFVs of an entry match the non-wildcard values in corresponding MFKs of the search target (fig. 10 (Final Match Vector); column 16, lines1-8) ; and use, if no entry has non-wildcard values in the MFVs that match the corresponding non-wildcard values in the MFKs, the queries to determine whether the entry has non-wildcard values in a MFV that match the non-wildcard values in a corresponding lead MFK, plus remaining MFVs that match corresponding remaining MFKs based on matching the non-wildcard values and wildcard values (fig. 10 (EMMM_Lookup) to (Final Match Vector); column 16, lines 9-67, column 17, lines 1-18).

However Liao does not specifically show single fields of a multiple-field source.

In the same field of endeavor, Gruenwald clearly shows the grouping single fields of a multiple-field source (fig. 4 (400); column 6, lines 1-8) into a search target (fig. 7 (740); column 3, lines 24-25).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multi-field search method, as taught by Liao, and provide the group the single fields into search target, as taught by Gruenwald, so that the search can be done proficiently.

Consder **claim 11**, and **as applied to claim 10 above**, Liao, as modified by Gruenwald, clearly shows that the entries of the data structure are stored such that the MFVs that have non-wildcard values are located at the end of the entry (column 1, lines 43-56, (In items 2-4, non-wildcard values are on the left hand side of the Longest Prefix Match route table).

Consder **claim 12**, and **as applied to claim 10 above**, Liao, as modified by Gruenwald, clearly shows that the entries of the data structure are arranged so that the MFVs that have non-wildcard values are placed at the end of the entry (column 1, lines 43-56, (item 5)).

Consider **claim 13**, and **as applied to claim 10 above**, Liao, as modified by Gruenwald, clearly disclose and show the non-wildcard values comprise a fixed value and/or a range of fixed values (column 2, lines 42-44).

Consider **claim 14**, and **as applied to claim 10 above**, Liao, as modified by Gruenwald, clearly disclose and show the apparatus, wherein the search unit locates the entry having non-wildcard values in the MFV that match the non-wildcard values in the corresponding lead MFK, plus remaining MFVs that match corresponding remaining

MFKs based on matching the non-wildcard values and wildcard values (fig. 10; column 16, lines 9-67, column 17, lines 1-18); and performs an operation associated with the located entry (fig. 10 (EMMM_Lookup) to (Final Match Vector));

Consider **claim 15**, and **as applied to claim 10 above**, Liao, as modified by Gruenwald, clearly disclose the method as described.

However Liao, as modified by Gruenwald, does not specifically show single fields of an item.

In the same field of endeavor, Gruenwald clearly shows the multiple-field source comprises a data packet having single fields in its header (fig. 3; fig. 6; column 8, lines 57-67).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multi-field search method, as taught by Liao, and provide the group the single fields into an item, as taught Gruenwald, so that the search can be done proficiently.

Consider **claim 16**, and **as applied to claim 15 above**, Liao, as modified by Gruenwald, clearly disclose the apparatus, wherein the operation comprises one of the following: dropping the data packet, mirroring, metering, traffic shaping, rate limiting,

accounting, statistics gathering, providing quality of service (QoS), redirecting to a central processing unit (CPU) for further processing, or sampling a subset of the packets to a CPU (column 1, lines 12-26; fig 12; column 6, lines 12-13; in addition, the application (paragraph 18) indicates that the above mentioned functions are known in the art).

Consider **claim 17**, and **as applied to claim 10 above**, Liao, as modified by Gruenwald, clearly disclose the apparatus, wherein fewer than all MFVs in the entries include one single field (fig.5 (ps0 and ps1); column 12, lines 4-18).

Consider **claim 18**, and **as applied to claim 10 above**, Liao, as modified by Gruenwald, clearly disclose the apparatus, wherein the MFVs in the entries include two or more single fields (fig.5 (ps0 and ps1); column 12, lines 4-18).

Consider **claim 19**, Liao, as modified by Gruenwald, clearly disclose and show an article of manufacture comprising:

a machine-accessible medium including thereon sequences of instructions that, when executed, cause an electronic system (column 4, lines 61-66) to:

having multiple-field keys (MFKs) (fig.5 (130, 140, 150 & 160); column 5, lines 61-62) in multiple-field vectors (MFVs) (MFVs) (fig. 5 (ps0 & ps1); column 12, lines 4-18) of entries in a data structure;

generate a set of queries (fig. 5 ((ps0, ps1); column 12, lines 4-18) based, at least in part, on the MFKs, wherein each query has a different MFK as a lead MFK ((ps0 has 010001) and (ps1 has 110010)); use a query (column 12, lines 19-46) to determine whether the non-wildcard values in the MFVs of an entry match the non-wildcard values in corresponding MFKs of the search target (fig. 10 (Final Match Vector); column 16, lines1-8); and

use, if no entry has
non-wildcard values in the MFVs that match the corresponding non-wildcard values in the MFKs, the queries to determine whether the entry has non-wildcard values in a MFV that match the non-wildcard values in a corresponding lead MFK, plus remaining MFVs that match corresponding remaining MFKs based on matching the non-wildcard values and wildcard values (fig. 10 (EMMM_Lookup) to (Final Match Vector); column 16, lines 9-67, column 17, lines 1-18).

However Liao does not specifically show single fields of a multiple-field source.

In the same field of endeavor, Gruenwald clearly shows the grouping single fields of a multiple-field source (fig. 4 (400); column 6, lines 1-8) into a search target (fig. 7 (740); column 3, lines 24-25).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multi-field search method, as taught by Liao, and provide the group the single fields into search target, as taught by Gruenwald, so that the search can be done proficiently.

Consder **claim 20**, and **as applied to claim 19 above**, Liao, as modified by Gruenwald, clearly shows that the entries of the data structure are stored such that the MFVs that have non-wildcard values are located at the end of the entry (column 1, lines 43-56, (In items 2-4, non-wildcard values are on the left hand side of the Longest Prefix Match route table).

Consder **claim 21**, and **as applied to claim 19 above**, Liao, as modified by Gruenwald, clearly shows that the entries of the data structure are arranged so that the MFVs that have non-wildcard values are placed at the end of the entry (column 1, lines 43-56, (In items 2-4, item 5)).

Consider **claim 22**, and **as applied to claim 19 above**, Liao, as modified by Gruenwald, clearly disclose and show the non-wildcard values comprise a fixed value and/or a range of fixed values (column 2, lines 42-44).

Consider **claim 23**, and **as applied to claim 19 above**, Liao, as modified by Gruenwald, clearly disclose and show the article of manufacture, wherein the machine-accessible medium further comprises sequences of instructions that, when executed, cause the electronic system to:

locate the entry having non-wildcard values in the MFV that match the non-wildcard values in the corresponding lead MFK, plus remaining MFVs that match corresponding remaining MFKs based on matching the non-wildcard values and wildcard values (fig. 10; column 16, lines 9-67, column 17, lines 1-18); and

performing an operation associated with the located entry (fig. 10 (EMMM_Lookup) to (Final Match Vector)).

Consider **claim 24**, and **as applied to claim 19 above**, Liao, as modified by Gruenwald, clearly disclose the method as described.

However Liao, as modified by Gruenwald, does not specifically show single fields of an item.

In the same field of endeavor, Gruenwald clearly shows the multiple-field source comprises a data packet having single fields in its header (fig. 3; fig. 6; column 8, lines 57-67).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multi-field search method, as taught by Liao, and provide the group the single fields into an item, as taught by Gruenwald, so that the search can be done proficiently.

Consider **claim 25**, and **as applied to claim 24 above**, Liao, as modified by Gruenwald, clearly disclose the article of manufacture, wherein the operation comprises one of the following: dropping the data packet, mirroring, metering, traffic shaping, rate limiting, accounting, statistics gathering, providing quality of service (QoS), redirecting to a central processing unit (CPU) for further processing, or sampling a subset of the packets to a CPU (column 1, lines 12-26; fig 12; column 6, lines 12-13; in addition, the application (paragraph 18) indicates that the above mentioned functions are known in the art).

Consider **claim 26**, and **as applied to claim 19 above**, Liao, as modified by Gruenwald, clearly disclose the method, wherein fewer than all MFVs in the entries include one single field (fig.5 (ps0 and ps1); column 12, lines 4-18).

Consider **claim 27**, and **as applied to claim 24 above**, Liao, as modified by Gruenwald, clearly disclose the method, wherein the MFVs in the entries include two or more single fields (fig.5 (ps0 and ps1); column 12, lines 4-18).

Consider **claim 28**, Liao clearly disclose and show a system, comprising:

a processor;

a network interface coupled with the processor; and

an article of manufacture comprising a machine-accessible medium including thereon sequences of instructions that, when executed, cause

an electronic system to (column 4, lines 61-66) :

group single fields of a multiple-field source into a search target having multiple-field keys (MFKs) (fig.5 (130, 140, 150 & 160); column 5, lines 61-62) whose single fields correspond to the single fields in multiple-field vectors (MFVs) (fig. 5 (ps0 & ps1); column 12, lines 4-18) of entries in a data structure;

generate a set of queries (fig. 5 ((ps0, ps1) , (ps1, ps0)) based, at least in part, on the MFKs, wherein each query has a different MFK as a lead MFK ((ps0 has 010001) and (ps1 has 110010));

use a query (column 12, lines 19-46) to determine whether the non-wildcard values in the MFVs of an entry match the non-wildcard values in corresponding MFKs of the search target (fig. 10 (Final Match Vector); column 16, lines1-8); and

use, if no entry has non-wildcard values in the MFVs that match the corresponding non-wildcard values in the MFKs, the queries to determine whether the entry has non-wildcard values in a MFV that match the non-wildcard values in a corresponding lead MFK, plus remaining MFVs that match corresponding remaining MFKs based on matching the non-wildcard values and wildcard values (fig. 10 (EMMM_Lookup) to (Final Match Vector); column 16, lines 9-67, column 17, lines 1-18).

However Liao does not specifically show single fields of a multiple-field source.

In the same field of endeavor, Gruenwald clearly shows the grouping single fields of a multiple-field source (fig. 4 (400); column 6, lines 1-8) into a search target (fig. 7 (740); column 3, lines 24-25).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multi-field search method, as taught by Liao, and provide the group the single fields into search target, as taught by Gruenwald, so that the search can be done proficiently.

Consider **claim 29**, and **as applied to claim 28 above**, Liao, as modified by Gruenwald, clearly disclose and show the non-wildcard values comprise a fixed value and/or a range of fixed values (column 2, lines 42-44).

Consider **claim 30**, and **as applied to claim 28 above**, Liao, as modified by Gruenwald, clearly disclose the method as described.

However Liao, as modified by Gruenwald, does not specifically show single fields of an item.

In the same field of endeavor, Gruenwald clearly shows the multiple-field source comprises a data packet having single fields in its header (fig. 4 (400); column 6, lines 1-8) into a search target (fig. 7 (740); column 3, lines 24-25).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multi-field search method, as taught by Liao, and provide the group the single fields into an item, as taught by Gruenwald, so that the search can be done proficiently.

Conclusion

Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Sai-Ming Chan whose telephone number is (571) 270-1769. The Examiner can normally be reached on Monday-Thursday from 6:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Rafael Pérez-Gutiérrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Sai-Ming Chan
S.C./ sc

April 12, 2007